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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Docket Number: DN A01448

Application of: Carl Michael Hesler et al.

Serial No: 10/699,900 : Group Art Unit: 1714

Filed: November 3, 2003 : Examiner: Callie E. Shosho
(Priority to 12-Nov-02)

Title: AQUEOUS INKJET INK COMPOSITION

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. § 1.131

We, Carl Michael Hesler and Eric Alvin Johnson, declare and say that:

1. We are the co-inventors of original claims 1-6 and revised claims 1-12 of the above-identified patent application.
2. Prior to September 27, 2002, we had completed the invention as described and claimed in the subject application in the United States of America, as evidenced by the following:
 - a. Prior to September 27, 2002, having earlier conceived of the idea of an aqueous inkjet ink composition for printing on a hydrophobic surface, Carl Michael Hesler prepared an inkjet ink composition in the laboratory at 767 Norristown Road, Spring House, Pennsylvania, as evidenced by pages 52 and 55 from Mr. Hesler's notebook attached hereto as Exhibit A.

CERTIFICATE OF TRANSMISSION

I certify that this paper, along with any referred to as being attached or enclosed, is being facsimile transmitted to (703) 872-9311 under 37 CFR § 1.8 on the date indicated below and is addressed to Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450.

July 27, 2006
Date of Deposit

Karl Stauss
Signature of Person Mailing Paper

KARL STAUSS
Name of Person Mailing Paper

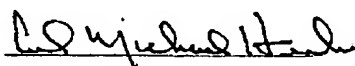

b. On page 52 of Exhibit A, an inkjet ink (CH2382) was prepared by mixing: (a) an aqueous emulsion polymer having a glass transition temperature (Tg) of 60 °C (referred to as NM2926); (b) a pigment dispersion (Acryjet® 357 from Rohm and Haas Company), (c) an anionic surfactant (Rhodacal™ DS-4 from Rhodia) and (d) a water-soluble surface agent (n-MP which is n-methylpyrrolidone).

c. On page 55 of Exhibit A, reference is made to having printed the above-identified inkjet ink (CH2382) on a hydrophobic surface (vinyl) with an inkjet printer.

3. Each of the dates deleted from Exhibit A is prior to September 27, 2002.

4. The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issuing thereon.

Respectfully submitted,

Carl Michael Hesler

Eric Alvin Johnson

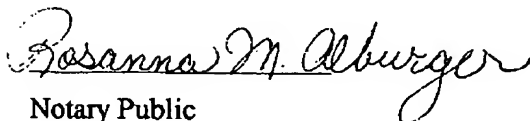
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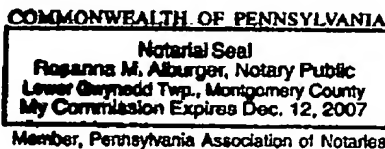
7/25/06

Date

Sworn to and subscribed before me this 25 day of July, 2006.



Notary Public



Rohm and Haas Company

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The initial materials we will examine include:

methyl carbitol
butyl carbitol
hexylene glycol
triethylene glycol mono butyl ether
ethyl acetate
propyl acetate
butanol
butyl cellosolve

The test procedure is to place a drop of the solvent onto the vinyl, cover the drop, wait 15 minutes and examine the test area. Variations in the texture or tackiness would suggest an interaction.

The dialysis material is still in the works. I will pull the tubes on Monday and determine the acid level of the dialysis material and the ultra filtration material. If the acid levels are comparable I will evaluate both binders in the standard formulation and if they perform well I will forward a supply of both to Avecia for evaluation.

Some of the solvents we tested on the vinyl film seem to have some surface interaction with the vinyl. Methyl and butyl carbitol appear to have an effect as well as ethyl acetate. The interesting thing is the methyl carbitol. We know that methyl carbitol, at a level below 5%, does work well in our standard formulation. Therefore I plan to evaluate methyl carbitol, at 2.5%, in an adapted carbon black formulation, with the high Tg (0.1% TREM) binder. Additionally I received a high gloss binder, HG-95P for evaluation.

CH2382

	-1
n-MP	3.2
methyl carbitol	1.5
PEG	2.0
EG-1	1.0
104E	0.4
DS-4	0.4
Acryjet 357	12.4
DI water	29.1
NM2926(60Tg)	10.0

Total 60.0

The target surface tension on this ink is about 28 dynes.

Signed: 

Witnessed By: 

Rohm and Haas Company
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55

The print problems with inks containing the binders continue. Tab Champlin (Robertson) suggested checking the binder particle size of the binders because we have two Microtrac particle size units and one is not calibrated properly. The out of calibration unit is primarily used during the binder synthesis. This could be part of the print problems. Our original particle size target is 260 to 275 nm. The two most current binders measure in the 300nm range.

I also need to measure the physical properties of the current inks to be sure they are in range and have not gradually crept out of specifications.

CH2384-1

HP 890 ink

Visc	2.5cps
Surface tension	40.8 dynes

2.5 cps
43.8 dynes

While we work on the binder issues with the current ink formulation I am also going to continue working with the En Cad vinyl program. The 2382 formulation shows that the addition of methyl carbitol boosts the adhesion of the ink to the vinyl substrate. I need to determine how much methyl carbitol is necessary to produce the good adhesion but will not ruin the ink stability. The initial prints will be made with the HP 690 printer. We received the En Cad print heads but we are waiting for the Lexmark printers that will become the print test beds.

CH2386

	-1	-2	-3	-4	-5
n-MP	1.6	1.6	1.6	1.6	1.6
methyl carbitol	0.75	1.5	1.5	2.0	2.0
PEG	1.0	1.0	1.0	1.0	1.0
EG-1	0.5	0.5	0.5	0.5	0.5
104E	0.2	0.2	0.2	0.2	0.2
DS-4	0.2	0.2	0.4	0.5	0.7
Acryjet 357	6.2	6.2	6.2	6.2	6.2
DI water	14.6	13.9	13.7	13.1	12.9
NM2926(60Tg)	5.0	5.0	5.0	5.0	5.0
Total	30.0	30.0	30.0	30.0	30.0
Surface tension	29.8	30.9	28.1	26.1	25.3

Print quality of -3 is in the right direction. Drop surface tension to 27 range for -4.

The 2386-4 sample is definitely in the game. Flash dry in the oven seems to seal the ink to the vinyl very well. I need to find out the abrasion testing method that En Cad uses. I scrubbed the film with a dry scrub brush and the film does not rub off or scratch. The print durability is equally good on the vinyl provided by En Cad and the vinyl we purchased from Avery Dennison.

Signed:

Witnessed By: